

# The Influence of Mobile phone's Forms in the User Perception

The Jaya Suteja and Stephany Tedjohartoko

**Abstract**—Not all types of mobile phone are successful in entering the market because some types of the mobile phone have a negative perception of user. Therefore, it is important to understand the influence of mobile phone's characteristics in the local user perception. This research investigates the influence of QWERTY mobile phone's forms in the perception of Indonesian user. First, some alternatives of mobile phone's form are developed based on a certain number of mobile phone's models. At the second stage, some word pairs as design attributes of the mobile phone are chosen to represent the user perception of mobile phone. At the final stage, a survey is conducted to investigate the influence of the developed form alternatives to the user perception. Based on the research, users perceive mobile phone's form with curved top and straight bottom shapes and mobile phone's form with slider and antenna as the most negative form. Meanwhile, mobile phone's form with curved top and bottom shapes and mobile phone's form without slider and antenna are perceived by the user as the most positive form.

**Keywords**—Influence, Mobile phone, Form, User Perception.

## I. INTRODUCTION

NOWADAYS, various types of mobile phone have been launched to the market. Though, not all types of mobile phone are successful in entering the market because some types of the mobile phone have a negative perception of user. User perception is an important factor that influences the will of the user to buy a product. Instead of the product image as a result of promotion effort, user perception is related to some characteristics of the product, in example colors, forms, dimensions.

Semantic Differential Method (SMD) is a widely used method in investigating the relation between product's characteristics and the perception of user. This method is first introduced by Osgood, C.E. and Suci, C.J. in 1957 [1]. This method is mostly combined with likert scale to quantify the perception of the user related to the product characteristics. As described by Hsu, S. H., Chuang, M. C., Chang, C. C, many researchers have used this method in the field of product design [2]. Hsu, S. H., Chuang, M. C., Chang, C. C, themselves investigate the differences between the designer perception and the user perception related to the design of telephone [2]. Chuang, M. C., Chang, C. C., Hsu, S. H., also use this method to examined user preference perception of

candy bar mobile phones and their relation to form design element [3].

However, research related to user perception that is done in a certain country may not give the same result as in other countries because user perception is influenced by local culture. Therefore, it is important to understand the influence of mobile phone's characteristics in the local user perception before entering a local market. This research investigates the influence of QWERTY mobile phone's forms in the perception of Indonesian user.

## II. RESEARCH METHODOLOGY

This research is performed in three stages. First, some alternatives of mobile phone's forms are developed based on a certain number of mobile phone's models. At the second stage, some word pairs as design attributes of the mobile phone are determined to represent the user perception of the mobile phone. At the final stage, a survey is conducted to investigate the influence of the developed mobile phone's forms in the user perception.

### A. Developing Alternatives of Mobile Phone's Form

At the first stage, a data collection is conducted to get information related to various design elements of the QWERTY mobile phone that are widely available. 110 mobile phone's models that are released in 2010 and before are used in this stage. Then, design elements of the mobile phone and their types are identified and classified from the received information. At this research, the identified design elements are limited to the mobile phone's body. Finally, the design elements are analyzed and synthesized to develop various alternatives of mobile phone's form.

### B. Determining Design Attributes

At this stage, design attributes of mobile phone that represent the user perception of mobile phone are chosen. Design attributes consist of some pairs of word that are antonym. The chosen design attributes adopt the image word pairs developed by Hsu, S. H., Chuang, M. C., Chang, C. C, and Chuang, M. C., Chang, C. C., Hsu, S. H., [2, 3]. The chosen design attributes also adopt the image words that are used by mobile phone vendor to build their product image.

### C. Investigating the Influence of Forms Alternatives to the User Perception

At the final stage, questionnaire is spread to 30 (15 males and 15 females) users of QWERTY mobile phone as respondent. Most of the respondents are college student in

J. S. The is with the Faculty of Engineering, University of Surabaya, Surabaya, Surabaya – 60293 Indonesia (phone: 62-31-2981397; fax: 62-31-2981151; e-mail: jayasuteja@ubaya.ac.id).

S. Tedjohartoko is with the Faculty of Engineering, University of Surabaya, Surabaya, Surabaya – 60293 Indonesia (phone: 62-31-2981397; fax: 62-31-2981151; e-mail: chellovehim@yahoo.com).

Surabaya, Indonesia.

First, some pictures that describe various alternatives of mobile phone's forms are shown to the respondents. Then, the respondents are asked to assign a score between 1 and 3 in scale of likert for each of design attributes. The assigned scores represent their perception related to design attributes of each alternative of mobile phone's forms. At this research, a score of 3 points means the alternative of mobile phone's form has a very strong positive impression of the design attributes. Meanwhile, a score of 1 point means the alternative of mobile phone's form has a very strong negative impression of the design attributes.

III. RESULT AND DISCUSSION

Based on 110 mobile phone's models, the design elements of mobile phone, which are related to the mobile phone's body, are top shape, bottom shape, antenna, and slider. Furthermore, types of each design elements are also identified and classified. These four design elements and their types are analyzed and synthesized using a morphological chart as shown in figure 1. As a result of analyzing and synthesizing, sixteen alternatives of mobile phone's forms are developed as shown in figure 2.

DESIGN ELEMENTS	TYPE 1	TYPE 2
Top Shape	—	⤿
Bottom Shape	—	⤿
Antenna	Internal Antenna	External Antenna
Slider	Without Slider	With Slider

Fig. 1 Design elements

At the next stage, design attributes of mobile phone are chosen to represent user perception of mobile phone's form. Nine image word pairs, which are chosen, are shown in table 1.

TABLE I  
IMAGE WORD PAIRS

General	Unique
Traditional	Modern
Inelegance	Elegance
Large	Compact
Comfortless	Comfortable
Low-class	High-class
Complicated	Simple
Weak	Strong
Boring	Fun

Based on the questionnaire which is spread to the users of QWERTY mobile phone, the perception of user to each type of mobile phone's forms is identified. Table 2 shows the user perception of mobile phone's forms. For example, type 15 of mobile phone's form is perceived by user as the most unique mobile phone's form. It means that user perceive that curve shape of top and bottom mobile phone's forms integrated with

external antenna but without slider as unique mobile phone's form. Meanwhile, mobile phone's form, which has straight top and bottom shape without antenna and slider, is perceived as general form by the user.

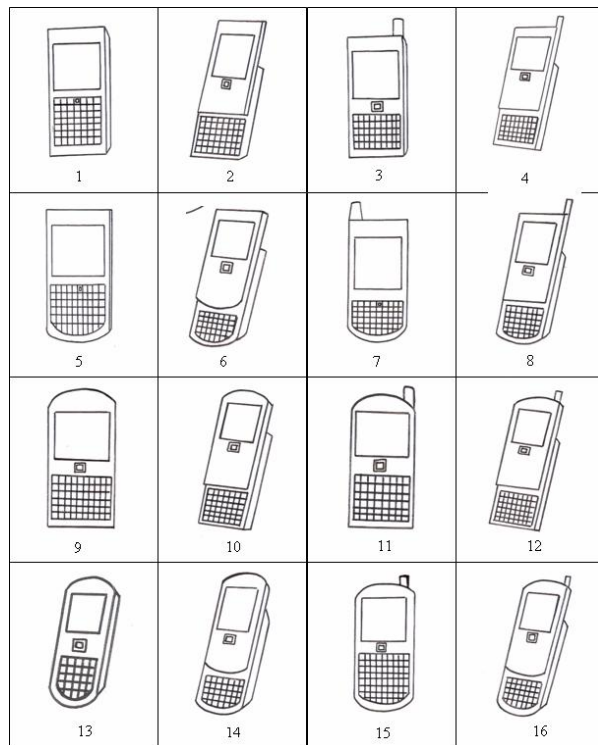


Fig. 2 Alternatives of mobile phone's forms

TABLE II  
DESIGN ATTRIBUTES OF MOBILE PHONE FORMS

Negative Design Attributes	Type Mobile Phone Forms		Positive Design Attributes
General	1	15	Unique
Traditional	3	14	Modern
Inelegance	6	11	Elegance
Large	10	9	Compact
Comfortless	5	11	Comfortable
Low-class	11	2	High-class
Complicated	10	5	Simple
Weak	4	9	Strong
Boring	1	13	Fun

Furthermore as shown in table 3, type 5 is perceived as the most positive mobile phone's form. Meanwhile, type 3 is perceived as mobile phone's form with the most negative attribute.

TABLE III  
USER PERCEPTION OF MOBILE PHONE FORMS

Type Mobile Phone Forms	Percentage of User Perception		
	Negative Design Attributes	Middle Design Attributes	Positive Design Attributes
1	40.4	38.1	21.5
2	23.3	57.0	19.6
3	55.6	34.4	10.0
4	39.3	54.1	6.7
5	4.1	50.0	45.9
6	25.2	48.5	26.3
7	25.6	54.8	19.6
8	44.4	43.3	12.2
9	14.1	43.3	42.6
10	49.6	36.3	14.1
11	48.9	39.3	11.9
12	48.5	41.5	10.0
13	13.8	42.8	43.5
14	25.9	46.3	27.8
15	18.5	47.8	33.7
16	34.1	49.6	16.3

As the mobile phone's forms are analyzed from their top and bottom shapes, table 4 shows the user perception of mobile phone with straight top and bottom shape. Mobile phone's form with straight top and bottom shapes is perceived as general, traditional, inelegance, large, comfortless, low-class, weak, boring but simple mobile phone.

TABLE IV  
USER PERCEPTION OF MOBILE PHONE'S FORM WITH STRAIGHT TOP AND BOTTOM SHAPES

Negative Design Attributes	Percentage of User Perception			Positive Design Attributes
	General	Traditional	Inelegance	
General	57.5	32.5	10.0	Unique
Traditional	50.8	40.8	8.3	Modern
Inelegance	48.3	39.2	12.5	Elegance
Large	40.8	48.3	10.8	Compact
Comfortless	31.7	52.5	15.8	Comfortable
Low-class	30.8	55.8	13.3	High-class
Complicated	18.3	55.0	26.7	Simple
Weak	38.3	41.7	20.0	Strong
Boring	40.0	47.5	12.5	Fun

Meanwhile, the user perception of mobile phone's form with straight top and curved bottom shapes is perceived as large but simple and fun mobile phone as shown in table 5.

Table 6 shows the user perception of mobile phone's form with curved top and straight bottom shapes. This type of mobile phone is perceived as general, traditional, inelegance, large, comfortless, low-class, weak, boring but simple mobile

phone. This type of mobile phone's form is perceived by user having the most negative form compare to others.

TABLE V  
USER PERCEPTION OF MOBILE PHONE'S FORM WITH STRAIGHT TOP AND CURVED BOTTOM SHAPE

Negative Design Attributes	Percentage of User Perception			Percentage of User Perception
	General	Traditional	Inelegance	
General	33.3	36.7	30.0	Unique
Traditional	33.3	37.5	29.2	Modern
Inelegance	30.8	39.2	30.0	Elegance
Large	33.3	50.8	15.8	Compact
Comfortless	29.2	43.3	27.5	Comfortable
Low-class	13.3	72.5	14.2	High-class
Complicated	10.8	53.3	35.8	Simple
Weak	26.7	45.8	27.5	Strong
Boring	12.5	63.3	24.2	Fun

TABLE VI  
USER PERCEPTION OF MOBILE PHONE'S FORM WITH CURVED TOP AND STRAIGHT BOTTOM SHAPE

Negative Design Attributes	Percentage of User Perception			Percentage of User Perception
	General	Traditional	Inelegance	
General	55.0	15.0	30.0	Unique
Traditional	50.0	36.7	13.3	Modern
Inelegance	48.3	43.3	8.3	Elegance
Large	32.5	45.0	22.5	Compact
Comfortless	40.0	35.0	25.0	Comfortable
Low-class	38.3	49.2	12.5	High-class
Complicated	20.9	53.6	25.5	Simple
Weak	45.0	30.0	25.0	Strong
Boring	30.0	54.2	15.8	Fun

In the meantime, the user perception of mobile phone's form with curved top and bottom shapes is perceived as unique, modern, comfortable, simple, fun but inelegance, large, low-class mobile phone as shown in table 7. This type of mobile phone's form is perceived by user having the most positive form compare to others.

TABLE VII  
USER PERCEPTION OF MOBILE PHONE'S FORM WITH CURVED TOP AND BOTTOM SHAPE

Negative Design Attributes	Percentage of User Perception			Percentage of User Perception
	General	Traditional	Inelegance	
General	20.2	30.3	49.6	Unique
Traditional	22.5	39.2	38.3	Modern
Inelegance	32.5	54.2	13.3	Elegance
Large	40.8	31.7	27.5	Compact
Comfortless	11.7	61.7	26.7	Comfortable
Low-class	27.5	56.7	15.8	High-class

Complicated	14.2	47.5	38.3	Simple
Weak	27.5	45.0	27.5	Strong
Boring	10.8	53.3	35.8	Fun

Table 8 to 11 show the user perception of mobile phone's form that is influenced by its slider and antenna. Table 8 shows the user perception of mobile phone's form with no slider and antenna. This type of mobile phone is perceived as unique, modern, compact, comfortable, simple, strong, fun but inelegance mobile phone. This type of mobile phone's form is perceived by user having the most positive form compare to others.

TABLE VIII  
USER PERCEPTION OF MOBILE PHONE'S FORM WITH NO SLIDER AND ANTENNA

Negative Design Attributes	Percentage of User Perception			Percentage of User Perception
General	33.6	22.7	43.7	Unique
Traditional	25.0	42.5	32.5	Modern
Inelegance	28.3	52.5	19.2	Elegance
Large	14.2	48.3	37.5	Compact
Comfortless	9.2	46.7	44.2	Comfortable
Low-class	16.7	69.2	14.2	High-class
Complicated	7.5	23.3	69.2	Simple
Weak	9.2	35.8	55.0	Strong
Boring	19.2	50.8	30.0	Fun

The user perception of mobile phone's form with slider is perceived as modern, elegance, fun but large, comfortless, complicated, weak mobile phone as shown in table 9.

TABLE IX  
USER PERCEPTION OF MOBILE PHONE'S FORM WITH SLIDER

Negative Design Attributes	Percentage of User Perception			Percentage of User Perception
General	34.2	26.7	39.2	Unique
Traditional	25.8	33.3	40.8	Modern
Inelegance	19.2	51.7	29.2	Elegance
Large	57.5	35.8	6.7	Compact
Comfortless	35.0	50.8	14.2	Comfortable
Low-class	23.3	56.7	20.0	High-class
Complicated	21.7	64.2	14.2	Simple
Weak	48.3	42.5	9.2	Strong
Boring	14.2	61.7	24.2	Fun

Table 10 shows the user perception of mobile phone's form with antenna. This type of mobile phone is perceived as general, traditional, inelegance, comfortless, low-class but simple mobile phone.

And, the user perception of mobile phone's form with slider and antenna is perceived as general, traditional, inelegance,

large, comfortless, low-class, complicated, weak, and boring mobile phone as shown in table 11. This type of mobile phone's form is perceived by user having the most negative form compare to others.

TABLE X  
USER PERCEPTION OF MOBILE PHONE'S FORM WITH ANTENNA

Negative Design Attributes	Percentage of User Perception			Percentage of User Perception
General	52.5	27.5	20.0	Unique
Traditional	65.0	30.0	5.0	Modern
Inelegance	55.8	39.2	5.0	Elegance
Large	24.2	49.2	26.7	Compact
Comfortless	36.7	40.0	23.3	Comfortable
Low-class	38.3	54.2	7.5	High-class
Complicated	10.0	58.3	31.7	Simple
Weak	25.8	47.5	26.7	Strong
Boring	25.8	50.8	23.3	Fun

TABLE VIII  
USER PERCEPTION OF MOBILE PHONE'S FORM WITH SLIDER AND ANTENNA

Negative Design Attributes	Percentage of User Perception			Percentage of User Perception
General	45.8	37.5	16.7	Unique
Traditional	40.8	48.3	10.8	Modern
Inelegance	56.7	32.5	10.8	Elegance
Large	51.7	42.5	5.8	Compact
Comfortless	31.7	55.0	13.3	Comfortable
Low-class	31.7	54.2	14.2	High-class
Complicated	25.5	64.5	10.0	Simple
Weak	54.2	36.7	9.2	Strong
Boring	34.2	55.0	10.8	Fun

#### IV. CONCLUSION

Based on the research, users perceive mobile phone's form with curved top and straight bottom shapes as the most negative form. Meanwhile, mobile phone's form with curved top and bottom shapes are perceived by the user as the most positive form. In addition, mobile phone's form with slider and antenna are perceived by the user as the most negative forms. However, users perceive mobile phone's form without slider and antenna as the most positive form.

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